

NAME: Dr. Reuven Ramaty

DATE OF BIRTH: February 25, 1937

PRESENT POSITION:

Senior Scientist, Laboratory For High Energy Astrophysics, Goddard Space Flight Center

RESEARCH AREAS:

High Energy Astrophysics, Gamma Ray Astronomy, Solar Physics,
Nuclear Astrophysics, Cosmic Rays

EDUCATION:

1961 - B.Sc. - Tel Aviv University
1966 - Ph.D. - University of California Los Angeles

PREVIOUS POSITIONS:

1958-1963 - Physics Teacher, Holtz Technical High School, Tel-Aviv, Israel
1964-1966 - Research Asst., University of California Los Angeles
1966-1967 - Asst. Res. Geophysicist, University of California Los Angeles
1967-1969 - NAS/NRC Post-Doctoral Res. Assoc., Goddard Space Flight Center
1969-1980 - Astrophysicist, Laboratory for High Energy Astrophysics, Goddard Space Flight Center
1980-1993 - Head, Theory Office, Laboratory for High Energy Astrophysics, Goddard Space Flight Center

OTHER POSITIONS:

Visiting Scientist, Stanford University 1972
Associate Editor, Physical Review Letters 1974-1977
Lecturer in Astronomy, University of Pennsylvania 1975
Vice Chair-Chair, Division of Cosmic Physics, American Physical Society, 1976 - 1978
Team Leader, Second Skylab Solar Flare Workshop, 1976-1978
Distinguished McDonnell Professor of Physics, Washington University, St. Louis, 1978
Fairchild Distinguished Scientist, California Institute of Technology, 1979
Chair, Nominating Committee, Division of Cosmic Physics, American Physical Society, 1979-1980
Adjunct Professor of Physics, University of Maryland, 1983 -
Vice Chair-Chair, High Energy Astrophysics Division, American Astronomical Society, 1983-1985
Divisional Councilor (Astrophysics), American Physical Society, 1986-1989
University of Paris, PhD Dissertation Committee (P. Wallyn), 1992
Nagoya University, Japan, Visiting Professor (3 months), 1993
Chair, Nominating Committee, High Energy Astrophysics Division, American Astronomical Society, 1997

Pierre & Marie Curie University, Paris, PhD Dissertation Committee (E. Parizot),

1997

Space Science Laboratory, University of California Berkeley, Visiting Scientist, 1999

AWARDS:

Senior U.S. Scientist Award, Alexander von Humboldt Foundation, 1975

Lindsay Award, Goddard Space Flight Center, 1980

Exceptional Scientific Achievement Medal, NASA, 1981

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

American Physical Society (Fellow)

American Astronomical Society

American Geophysical Union

International Astronomical Union

BOOKS EDITED:

High Energy Phenomena on the Sun, NASA SP-342, 1972

Gamma Ray Spectroscopy in Astrophysics, NASA TM-79619, 1978

Tenth Texas Symposium on Relativistic Astrophysics, Ann. N. Y. Acad. Sci. Vol. 375, 1980

Positron-Electron Pairs in Astrophysics, AIP Conference Proceedings No. 101, 1983

Essays in Space Science, NASA CP 2464, 1987

High Energy Solar Physics, AIP Conference Proceedings 374, 1996

LiBeB, Cosmic Rays and Related X- and Gamma-Rays, Astron. Soc. Pacific, Conf. Ser. Vol. 171, 1999

High Energy Solar Physics – Anticipating HESSI, Astron. Soc. Pacific, Conf. Ser. Vol. 206, 2000

SCIENTIFIC ADVISORY:

NAS/NRC Post-Doctoral Research Associate Program. Research Associates and Senior Research Associates: Drs. D. Borner, J. Cohen, B. Kozlovsky, C. Ryter, B. Smith, A. Marscher, R. Weaver, D. Leiter, J. Weatherall, C. Dermer, M. Elitzur, J. Blondin, N. Guessoum, A. Dar, K. W. Chan, L. Ozernoy, J. P. Meyer, N. Mandzhavidze, X.-M. Hua, V. Tatischeff, S. Scully, G. Lenters

University of Maryland, Physics Department, PhD Dissertations:

H. T. Wang, Ph.D. 1975, "Neutron Propagation and 2.2 MeV Gamma Ray Line Formation in the Solar Atmosphere"

T. Bai, Ph.D. 1977, "Studies on Solar Hard X-Rays and Gamma Rays: Compton Backscatter Anisotropy, Polarization and Evidence for Two Phases of Acceleration."

R. Bussard, Ph.D. 1978, "Topics in X-Ray and Gamma Ray Spectroscopy."

R. J. Murphy, Ph.D. 1985, "Gamma Rays and Neutrons from Solar Flares"

- J. A. Miller, Ph. D. 1990, "Ion and Electron Acceleration and Transport, and Gamma Ray Production, in Solar Flares"
- J. G. Skibo, PhD 1993, "Diffuse Galactic Positron Annihilation Radiation and the Underlying Continuum"

PROPOSALS:

- Principal Investigator: Energetic Particle Acceleration, NASA's Solar Terrestrial Theory Program, 1980 - 1986
- Principal Investigator: Theoretical High Energy Solar Physics, NASA, 1982 -
- Principal Investigator: Particle Acceleration in Impulsive Flares, NASA, 1991 - 1994
- Co-Principal Investigator: Acceleration of Positrons in Supernova Shocks and Other Primary Sources of Positrons, NASA, 1988 - 1991
- Guest Investigator: Solar Maximum Mission 1978
- Guest Investigator: Solar Maximum Mission 1988-1989
- Guest Investigator: COMPTON Gamma Ray Observatory 1992-1998
- Co-Investigator: Nuclear Astrophysics Explorer 1988-1989
- Co-Investigator: Positron Electron Magnet Spectrometer, Earth Observing System, 1989 - 1991
- Co-Investigator: Theoretical Gamma Ray Astrophysics, NASA, 1988-1994
- Co-Investigator: Astrophysics Theory Program, NASA, 1994-
- Co-Investigator: High Energy Solar Spectroscopic Imager, HESSI, NASA, 1997 -
- Co-Guest Investigator: Rossi X-ray Timing Explorer, NASA, 1997

CONFERENCES ORGANIZED

- High Energy Phenomena on the Sun, Goddard Space Flight Center, 1972
- Gamma Ray Spectroscopy in Astrophysics, Goddard Space Flight Center, 1978
- Tenth Texas Symposium On Relativistic Astrophysics, Baltimore, MD, 1980
- Positron-Electron Pairs in Astrophysics, Goddard Space Flight Center, 1983
- F. B. McDonald 60th Birthday Symposium, Goddard Space Flight Center, 1985
- High Energy Solar Physics, Goddard Space Flight Center, 1995
- High Energy Solar Physics – Anticipating HESSI, College Park, MD, 1999

INVITED TALKS (since 1991)

- "Solar Gamma Ray Astrophysics" AAS/Solar Physics Division, Huntsville, April 1991
- "Particle Acceleration in Solar Flares" Gordon Conference, Plymouth, New Hampshire, August 1991
- "Positron Annihilation in the Molecular Cloud Associated with 1E1740.7-2872" Aspen Astrophysics Winter Workshop, January 1992
- "Diffuse Galactic Annihilation Radiation" Recent Advances in High Energy Astronomy, Toulouse, France, March 1992
- "Galactic Annihilation Radiation" Ginzburg Symposium, National Institute of Standards and Technology, Gaithersburg, MD, May 1992
- "High Energy Particles in Solar Flares" ESLAB Symposium Study of the Solar Terrestrial System, Killarney, Ireland, June 1992

- “Mechanisms for Flare Particle Acceleration” COSPAR, Fundamental Problems in Solar Activity, Washington, DC, September 1992
- “Implications of Diffuse < 1MeV Gamma Rays” 3rd Annual October Astrophysics Conference, Back to the Galaxy, College Park, October 1992
- “Gamma Rays from Solar Flares” COMPTON/GRO Workshop, St Louis, October 1992
- “Theoretical Models of High Energy Solar Emissions”, IAU Colloquium 142, University of Maryland, January 1993
- “511 keV Line in the Galaxy”, INTEGRAL WORKSHOP, Les Diablerets, Switzerland, February 1993
- “Theoretical Models of High Energy Solar Emissions”, High Energy Physics of Solar Flares Workshop, Waterville Valley, NH, March 1993
- “Particle Acceleration in Solar Flares”, Second Gordon Research Conference on Solar MHD and Plasma Processes, August 1993
- “Particle Acceleration in Solar Flares, Japanese Physical Society Meeting, Kochi, Shikoku, Japan, October 1993
- “Gamma Rays from Accelerated Particle Interactions”, NATO School on The Gamma Ray Sky after SIGMA and CGRO, Les Houches, France, January 1994
- “Gamma Ray Line Astronomy” NATO School on the Gamma Ray Sky after SIGMA and CGRO, Les Houches, France, January 1994
- “Gamma Ray Spectroscopy”, Emission Lines in Astrophysics, Symposium in Honor of Seaton and Osterbrok, Space Telescope Science Institute, Baltimore, MD, May 1994
- “High Energy Processes in Solar Flares”, Symposium on Solar Physics, Nagoya University, Japan, June 1993
- “Gamma Ray Line Astronomy”, Symposium on Ultra High Energy Gamma Ray Astronomy, Waseda University, Japan, June 1994
- “On the Origin of the 0.4 and 0.2 MeV Lines from Galactic Black Hole Candidates”, CGRO-SIGMA Symposium, Marcel Grossman Relativity Conference, Stanford University, July, 1994
- “Deexcitation Gamma Ray Line and Isotope Production”, Workshop on the Evolution of Star-Forming Regions, Center for Astrophysics, October 1994
- “Gamma Ray Line Emission from the Orion Complex”, Gamma Ray Line Astrophysics Mini Symposium, 17th Texas Symposium on Relativistic Astrophysics, Munich, December 1994
- “Gamma Ray Lines from the Orion Complex and the Interstellar Medium”, Center for Astrophysics, January 1995
- “Gamma Ray Lines from the Orion Complex and the Interstellar Medium”, Saclay, France, April 1995
- “Gamma Ray Lines from Interstellar Accelerated Particle Interactions”, COMPTON Symposium, Munich, June 1995
- “Low Energy Cosmic Ray Interactions in Astrophysics”, The Sun and Beyond Conference, Ho Chi Minh City, Vietnam, October 1995
- “Low Energy Cosmic Ray Interactions in Astrophysics”, Caltech, December 1995
- “Positron Astrophysics”, University of Bonn, May 1996

- “Gamma Ray Lines from Orion and the Origin of the Light Isotopes”, Max Planck Institute fuer Radioastronomie, Bonn, May 1996
- “High-Energy Solar Gamma Rays”, Workshop on the Next Generation High Energy Gamma Ray Telescope, Goddard Space Flight Center, September 1996
- “The Light Isotopes: Nucleosynthesis by Cosmic Rays”, W. R. Webber Symposium on Cosmic Rays in the Heliosphere and Galaxy, University of New Hampshire, October 1996
- “Light Elements and Cosmic Rays in the Early Galaxy”, Astrophysics Seminar, UCSD, February 1997
- “Light Elements and Cosmic Rays in the Early Galaxy”, American Physical Society Spring Meeting, Washington DC, April 1997
- “Galactic Nuclear Line Emission: Orion”, Fourth Compton Symposium, Williamsburg, Virginia, April 1997
- “Gamma Ray Lines from Solar Flares and the Orion Star Formation Region”, Bartol Research Institute, May 1997
- “What Can We Learn about Particle Acceleration by Observing Gamma Rays from Solar Flares”, AGU, Baltimore, May 1997
- “Low Energy Cosmic Ray Interactions in Astrophysics”, Orsay, France, June 1997
- “Cosmic Rays, Nuclear Gamma Rays and the Origin of Li, Be and B”, Michigan State University, East Lansing, MI, October 1997
- “Cosmic Rays, Nuclear Gamma Rays and the Origin of Li, Be and B”, KFKI, Budapest, Hungary, May 1998
- “Gamma Rays from Solar Flares”, Space Science Lab, Berkeley, June 1998
- “Evolution of Be and B and the Origin of Cosmic Rays”, Nuclei in the Cosmos V, Volos, Greece, July 1998
- “Nuclear Processes in Solar Flares”, Energetic Processes on the Sun and in the Heliosphere, WE-Hereaus Seminar, Bad Honnef, Germany, October 1998
- “LiBeB and the Origin of the Cosmic Rays”, Workshop on LiBeB, Cosmic Rays and Gamma Rays, Paris, December, 1998
- “Nucleosynthesis and Accelerated Particles”, Mini-Symposium on Nucleosynthesis, Texas Symposium on Relativistic Astrophysics, Paris, December 1998
- “LiBeB and the Origin of the Cosmic Rays”, Stanford University, February 1999
- “Gamma Rays from Solar Flares”, IAU Symp. 195, Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas, Bozeman, Montana, July 1999
- “Nucleosynthesis by Accelerated Particles”, Workshop on Astronomy with Radioactivities, Schloss Rindberg, Germany, September 1999
- “High Energy Processes in Solar Flares”, Cosmic Explosions, College Park, MD, October 1999
- “Light Elements and the Origin of the Cosmic Rays”, The Light Elements and their Evolution, IAU Symp 198, Natal, Brazil, November 1999
- “Galactic LiBeB Origin and Evolution”, Laboratory for Astrophysics and Solar Physics, Goddard Space Flight Center, April 2000

"Diffuse Galactic Gamma Ray Lines", Advanced Compton Telescope Workshop", NRL,
May 2000

"Spallogenic Light Elements and Cosmic Ray Origin", ISSI Bern, Switzerland, May 2000

PUBLICATIONS IN REFEREED JOURNALS AND BOOKS

1. 1966 "Galactic Cosmic Ray Electrons", R. Ramaty and R. E. Lingenfelter, JGR 71, 3687.
2. 1966 "Cosmic Ray Electron Lifetimes in the Galactic Disk and Halo", R. Ramaty and R. E. Lingenfelter, Phys. Rev. Letters 17, 522
3. 1967 "The Influence of the Ionized Medium on Synchrotron Emission Spectra in the Solar Corona", R. Ramaty and R. E. Lingenfelter, JGR 72, 879.
4. 1967 "On the Origin of Solar Flare Microwave Bursts", R. E. Lingenfelter and R. Ramaty, Planet. and Space Science 15, 1303.
5. 1968 "Cosmic Ray Deuterium and Helium-3 Nuclei", R. Ramaty and R. E. Lingenfelter, Can. J. Phys. 46, s627.
6. 1968 "The Influence of the Ionized Medium on Synchrotron Emission on Intermediate Energy Electrons", R. Ramaty, JGR 73, 3573.
7. 1968 "Solar Modulation and the Galactic Intensity of Cosmic-Ray Positrons and Negatrons", R. Ramaty and R. Lingenfelter, Phys. Rev. Letters 20, 120.
8. 1968 "Determination of the Coronal Magnetic Field and the Radio Emitting Electron Energy from a Type IV Solar Radio Burst", R. Ramaty and R. E. Lingenfelter, Solar Physics 5, 531.
9. 1969 "Cosmic Ray Deuterium and Helium 3 of Secondary Origin and the Residual Modulation of Cosmic Rays", R. Ramaty and R. E. Lingenfelter, Ap. J. 155, 587.
10. 1969 "Microwave and Hard X Ray Bursts from Solar Flares", S. Holt and R. Ramaty, Solar Physics 8, 119.
11. 1969 "Physical Properties of the Radio Emitting Region in Sco X-1", G. Riegler and R. Ramaty, Ap. Letters 4, 27.
12. 1969 "Gyrosynchrotron Emission and Absorption in a Magnetoactive Plasma", R. Ramaty, Ap. J. 158, 753.
13. 1969 "On the Nature of the High Frequency Cutoffs of Type IV Solar Radio Bursts", R. Ramaty, Astrophys. Lett., 4, 43.
14. 1969 "Anomalous Temporal Behavior of NP 0532", R. Ramaty and S. S. Holt, Nature 224, 1003.
15. 1970 "Low Energy Cosmic Ray Positrons and 0.51 MeV Gamma Rays from the Galaxy", R. Ramaty, F. Stecker, and D. Misra, J. Geophys. Res. 75, 1141.
16. 1970 "Pulsars and X-Ray Emitting Supernova Remnants", S. Holt and R. Ramaty, Ap. Letters 5, 89.
17. 1970 "Polarization Reversal of Solar Microwave Bursts", R. Ramaty and S. S. Holt, Nature 226, 68.
18. 1970 "Statistical Discrete Source Model of Local Cosmic Rays", R. Ramaty, D. V. Reames and R. E. Lingenfelter, Phys. Rev. Letters 24, 913.

19. 1970 "Interstellar Cosmic Ray Spectra from the Nonthermal Radio Background from 0.4 to 400 MHz", M. L. Goldstein, R. Ramaty, and L. A. Fisk, Phys. Rev. Letters 24, 1193.
20. 1970 "Energy Loss of Cosmic Rays in the Interplanetary Medium" M. L. Goldstein, L. A. Fisk, and R. Ramaty, Phys. Rev. Letters 25, 832.
21. 1970 "Pulsar Distributions without Magnetic Decay", S. S. Holt and R. Ramaty, Nature 228, 351.
22. 1971 "X-Rays from Centaurus A and the Far Infrared Background Radiation", R. Ramaty, Science 171, 500.
23. 1971 "Compound Diffusion of Cosmic Rays", R. E. Lingenfelter, R. Ramaty, and L. A. Fisk, Ap. Letters 8, 93.
24. 1971 "Ionization and Heating of the Gum Nebula by Energetic Particles from the Vela X Supernova", R. Ramaty, E. A. Boldt, S. A. Colgate, and J. Silk, Ap. J. 169, 87.
25. 1971 "Origin of Cosmic Electrons from About 10^2 to 10^6 GeV", R. Ramaty and R. E. Lingenfelter, Phys. Rev. Letters 27, 1309.
26. 1972 "The Influence of the Ionized Medium on Synchrotron Emission in Interstellar Space", R. Ramaty, Ap. J. 179, 157.
27. 1972 "On Transition Radiation as a Source of Cosmic X Rays", R. Ramaty and R. D. Bleach, Astrophys. Letters 11, 35.
28. 1972 "On the Origin of 200 keV Interplanetary Electrons", R. Ramaty, T. L. Cline, and L. A. Fisk, Phys. Rev. (Letters) 29, 1039.
29. 1973 "Transition Radiation in Astrophysics", G. B. Yodh, X. Artru, and R. Ramaty, Ap. J. 181, 725.
30. 1972 "Inner Bremsstrahlung as a Source of X-Rays in the Steady State Universe", V. Petrosian and R. Ramaty, Ap. J. (Letters) 173, L83.
31. 1972 "Free Free Absorption of Gyrosynchrotron Radiation in Solar Microwave Bursts", R. Ramaty and V. Petrosian, Ap. J. 178, 241.
32. 1973 "Positron Annihilation Radiation from Neutron Stars", R. Ramaty, G. Borner, and J. M. Cohen, Ap. J. 181, 891.
33. 1973 "Cas A X-Ray Spectrum: Evidence for Iron Line Emission", P. J. Serlemitsos, E. A. Boldt, S. S. Holt, R. Ramaty, and A. F. Brisken, Ap. J. (Letters) 184, L1.
34. 1973 "Cosmic Electrons: Influence of Energy Dependent Escape from the Galaxy", R. F. Silverberg and R. Ramaty, Nature 243, 134.
35. 1973 "Consistency of Cosmic Ray Source Composition with Explosive Nucleosynthesis", B. Kozlovsky and R. Ramaty, Nature Phys. Sci. 243, 135.
36. 1973 "Cosmic Ray Sources: Evidence for Two Acceleration Mechanisms" R. Ramaty, V. K. Balasubrahmanyam, J. F. Ormes, Science 180, 731.
37. 1974 "Scorpius X-1: Origin of the Radio and Hard X-Ray Emissions", R. Ramaty, C. C. Cheng, and S. Tsuruta, Ap. J. 187, 61.
38. 1974 "Neutron Propagation and 2.2 MeV Gamma Ray Line Production in the Solar Atmosphere", H. T. Wang and R. Ramaty, Solar Physics 36, 129.

39. 1974 "An Interpretation of the Observed Oxygen and Nitrogen Enhancements in Low Energy Cosmic Rays", L. A. Fisk, B. Kozlovsky, and R. Ramaty, Ap. J. (Letters) 190, L35.
40. 1974 " ^2H , ^3H , and ^3He Production in Solar Flares", R. Ramaty and B. Kozlovsky, Ap. J. 193, 729.
41. 1974 "478 keV and 431 keV Line Emissions from $\alpha - \alpha$ Reactions", B. Kozlovsky and R. Ramaty, Ap. J. (Letters) 191, L43.
42. 1974 "Cosmic Rays: Astronomy with Energetic Particles", P. Meyer, R. Ramaty, W. R. Webber, Physics Today 27, 23.
43. 1974 "Li Production in $\alpha - \alpha$ Reactions", B. Kozlovsky and R. Ramaty, Astronomy and Astrophysics, 34, 477.
44. 1974 "A Comment on Gamma Ray Lines from ^4He ", B. Kozlovsky and R. Ramaty, Astronomy and Astrophysics 36, 307.
45. 1975 "Solar Gamma Rays", R. Ramaty, B. Kozlovsky and R. E. Lingenfelter, Space Science Reviews 18, 341.
46. 1975 "Time dependent 2.2 MeV and 0.5 MeV Lines from Solar Flares", H. T. Wang and R. Ramaty, Ap. J. 202, 532.
47. 1976 "Formation of the 0.511 MeV Line in Solar Flares" C. J. Crannell, G. Joyce, R. Ramaty and C. Werntz, Ap. J. 210, 582.
48. 1976 "Solar Gamma Ray Lines as Probes of Charged Particle Directionalities in Solar Flares", R. Ramaty and C. J. Crannell, Ap. J. 203, 766.
49. 1976 "Electrons in a Closed Galaxy Model for Cosmic Rays", R. Ramaty and N. J. Westergaard, Astrophysics and Space Science 46, 143.
50. 1976 "Gamma Ray and Microwave Evidence for Two Phases of Acceleration in Solar Flares" T. Bai and R. Ramaty, Solar Physics 49, 343.
51. 1977 "Gamma Ray Lines from Interstellar Grains", R. E. Lingenfelter and R. Ramaty, Ap. J. (Letters) 211, L19.
52. 1977 "Narrow Lines from Alpha-Alpha Reactions", B. Kozlovsky and R. Ramaty, Astrophys. Letters 19, 19.
53. 1977 "The Solar Gamma Ray Spectrum between 4 and 8 MeV", R. Ramaty, B. Kozlovsky and A. Suri, Ap. J. 214, 617.
54. 1977 " ^{26}Al : A Galactic Source of Gamma Ray Line Emission", R. Ramaty and R. E. Lingenfelter, Ap. J. (Letters) 213, L5.
55. 1978 "Backscatter, Anisotropy and Polarization of Solar Hard X Rays", T. Bai and R. Ramaty, Ap. J. 219, 705.
56. 1978 "X-Ray and Gamma Ray Line Production of Nonthermal Ions", R. W. Bussard, K. Omidvar and R. Ramaty, Ap. J. 220, 353.
57. 1978 "Gamma Ray Lines: A New Window to the Universe", R. E. Lingenfelter and R. Ramaty, Physics Today 31, 40.
58. 1979 "The Annihilation of Galactic Positrons", R. W. Bussard, R. Ramaty and R. J. Drachman, Ap. J. 228, 928.
59. 1979 "Nuclear Gamma Rays from Energetic Particle Interactions", R. Ramaty, B. Kozlovsky, R. E. Lingenfelter, Ap. J. (Suppl.), 40, 487.

60. 1979 "Solar Gamma Rays above 8 MeV", C. J. Crannell, H. Crannell, R. Ramaty, Ap. J., 229, 762.
61. 1979 "Hard X-Ray Time Profiles and Acceleration Processes in Large Solar Flares", T. Bai and R. Ramaty, Ap. J., 227, 1072.
62. 1979 "Gamma Ray Line Astronomy", R. Ramaty and R. E. Lingenfelter, Nature, 278, 127.
63. 1979 "Astrophysical Gamma Ray Spectroscopy", R. Ramaty, R. E. Lingenfelter and B. Kozlovsky, Comments on Astrophysics, 8, 99.
64. 1980 "Energetic Particles in Solar Flares", R. Ramaty, S. A. Colgate, G. A. Dulk, P. Hoyng, J. W. Knight, R. P. Lin, D. B. Melrose, C. Paizis, F. Orrall, P. R. Shapiro, D. F. Smith, M. Van Hollebeke, Chapter 4 in Solar Flares, ed. P. A. Sturrock, p. 117.
65. 1980 "On the Origin of the March 5, 1979 Gamma Ray Transient: A Vibrating Neutron Star in the Large Magellanic Cloud", R. Ramaty et al., Nature, 287, 122.
66. 1981 "Synchrotron Cooling and Annihilation of an e^+e^- Plasma: The Radiation Mechanism for the March 5, 1979 Transient", R. Ramaty, R. E. Lingenfelter and R. W. Bussard, Astrophys. and Space Science, 75, 193.
67. 1981 "Interpretations and Implications of Gamma Ray Lines from Solar Flares, The Galactic Center and Gamma Ray Transients", R. Ramaty and R. E. Lingenfelter, Philosophical Transactions of the Royal Society London A 301, 671.
68. 1981 "Annihilation Radiation from a Hot e^+e^- Plasma", R. Ramaty and P. Meszaros, Astrophysical Journal, 250, 384.
69. 1982 "On the Theory of Gamma Ray Amplification Through Stimulated Annihilation Radiation (GRASAR)", R. Ramaty, J. M. McKinley, F. C. Jones, Astrophysical Journal, 256, 238.
70. 1982 "Gamma-Ray Astronomy" R. Ramaty and R. E. Lingenfelter, Ann. Rev. Nuclear and Particle Science, 32, 235.
71. 1983 "Advances in Gamma Ray Line Astronomy" R. Ramaty and R. E. Lingenfelter, Advances in Space Research, 3, 123.
72. 1983 "Gamma Ray Lines and Neutrons from Solar Flares" R. Ramaty, R. J. Murphy, B. Kozlovsky and R. E. Lingenfelter, Solar Physics 86, 395.
73. 1983 "Implications of High Energy Neutron Observations from Solar Flares" R. Ramaty, R. J. Murphy, B. Kozlovsky and R. E. Lingenfelter, Ap. J. (Letters), 273 L41.
74. 1983 "Gamma Ray Line Astronomy", R. Ramaty and R. E. Lingenfelter, Space Science Reviews, 36, 305.
75. 1984 "Nuclear Processes in the Jets of SS433", R. Ramaty, B. Kozlovsky, R. E. Lingenfelter, Ap. J. (Letters) 283, L13.
76. 1984 "Solar Flare Neutrons and Gamma Rays", R. J. Murphy and R. Ramaty, Advances in Space Research, 4, No. 7, 127.
77. 1985 "More of the Unseen" (book review), R. Ramaty, Nature, 315, 780.
78. 1985 "Shock Acceleration of Electrons and Ions in Solar Flares", D. C. Ellison and R. Ramaty, Astrophys. J. 298, 400.

79. 1986 "The Acceleration and Propagation of Solar Flare Energetic Particles" M. A. Forman, R. Ramaty and E. G. Zweibel, *The Physics of the Sun*, P. A. Sturrock (ed.), D. Reidel, p. 251.
80. 1986 "Particle Acceleration", L. Vlahos, M. E. Machado, R. Ramaty et al., *Energetic Phenomena on the Sun*, M. Kundu and B. Woodgate (eds.), NASA CP 2439, p. 24.
81. 1986 "Nuclear Processes in Solar Flares", R. Ramaty, *The Physics of the Sun*, P. A. Sturrock (ed.), D. Reidel, p. 293.
82. 1986 "Directionality of Bremsstrahlung from Relativistic Electrons in Solar Flares", C. D. Dermer and R. Ramaty, *Astrophys. J.* 301, 962
83. 1986 "Secondary Antiproton Production in Relativistic Plasmas", C. D. Dermer and R. Ramaty, *Nature*, 319, 205.
84. 1986 "Pion Decay Radiation and Two-Phase Acceleration in the June 3, 1982 Solar Flare", R. Ramaty, R. J. Murphy and C. D. Dermer, *Advances in Space Research*, 6, No. 6., 119.
85. 1986 "Cosmic Gamma Ray Lines", R. Ramaty and R. E. Lingenfelter, *Adv. Space Res.* 6, No. 4, 121.
86. 1987 "High Energy Processes in Solar Flares", R. J. Murphy, C. D. Dermer and R. Ramaty, *Ap. J. (Suppl.)* 63, 721.
87. 1987 "Positrons from Accelerated Particle Interactions", B. Kozlovsky, R. E. Lingenfelter and R. Ramaty, *Ap. J.* 316, 801, 1987.
88. 1987 "On the Origin of the Pion Decay Radiation in the June 3, 1982 Solar Flare", R. Ramaty, R. J. Murphy, C. D. Dermer, *Ap. J. Letters*, 316, L41, 1987.
89. 1987 "Nuclear Process and Accelerated Particles in Solar Flares", R. Ramaty and R. J. Murphy, *Space Science Reviews*, 45, 213.
90. 1987 "Nuclear Processes and Accelerated Particles in Solar Flares", R. Ramaty, *Solar Physics*, 113, 203.
91. 1987 "Ion and Relativistic Electron Acceleration by Alfvén and Whistler Turbulence in Solar Flares", J. A. Miller and R. Ramaty, *Solar Physics*, 113, 195.
92. 1988 "Gamma Ray, Neutron and Hard X-Ray Studies and Requirements for a High Energy Solar Physics Facility", R. Ramaty, B. R. Dennis and A. G. Emslie, *Solar Physics*, 118, 17.
93. 1988 "Gamma Ray Spectroscopic Tests for the Anisotropy of Accelerated Particles in Solar Flares", R. J. Murphy, B. Kozlovsky and R. Ramaty, *Ap. J.*, 331, 1029.
94. 1988 "Solar Neon Abundances from Gamma-Ray Spectroscopy and ^3He -Rich Particle Events", D. V. Reames, R. Ramaty and T. T. von Rosenvinge, *Ap. J. (Letters)*, 332, L87.
95. 1989 "Deexcitation Gamma Ray Line Emission from Solar Flare Magnetic Loops", X. M. Hua, R. Ramaty, and R. E. Lingenfelter, *Ap. J.*, 341, 516.
96. 1989 "Relativistic Electron Transport and Bremsstrahlung Production in Solar Flares", J. A. Miller and R. Ramaty, *Ap. J.*, 344, 973.
97. 1989 "The Nature of the Annihilation Radiation and Gamma Ray Continuum from the Galactic Center Region", R. E. Lingenfelter and R. Ramaty, *Ap. J.*, 343, 686.

98. 1989 "Origin of the Annihilation Radiation from the Galactic Center Region", R. E. Lingenfelter and R. Ramaty (Invited Paper), Nuclear Physics B, (Proc. Suppl.), 10B, 67.
99. 1990 "Ion and Relativistic Electron Transport in Solar Flares" R. Ramaty, J. A. Miller, X. M. Hua, and R. E. Lingenfelter (Invited Paper) Ap. J. Suppl., 73, 199.
100. 1990 "⁷Li and ⁷Be Deexcitation Lines: Probes for Accelerated Particle Transport Models in Solar Flares" R. J. Murphy, X. M. Hua, B. Kozlovsky and R. Ramaty, Ap. J., 351, 299.
101. 1990 "Stochastic Fermi Acceleration in Solar Flares" J. A. Miller, N. Guessoum and R. Ramaty, Ap. J., 361, 701.
102. "Solar Abundances from Gamma Ray Spectroscopy: Comparisons with Energetic Particle and Photospheric Abundances" Murphy, R. J., Ramaty, R., Kozlovsky, B. and Reames, D. V., 1991, ApJ, 371, 793
103. "Positron Annihilation in the Interstellar Medium" Guessoum, N., Ramaty, R. and Lingenfelter, R. E., 1991, ApJ, 378, 170
104. "Accelerated Particles in Solar Flares" Ramaty, R. & Simnett, G. M., The Sun in Time, ed. Sonett, C. P., Giampapa, M. S. & Matthews, M. S., 1991, (Tucson: Univ. of Arizona Press), p.232
105. "Gamma Ray Line Astrophysics" Ramaty, R. and Prantzos, N., 1991, Comments on Astrophysics, 15, 301
106. "Annihilation Near the Centre" Ramaty, R. and Lingenfelter, R. E., 1991, (Invited News and Views), Nature, 353, 215
107. "Gamma Ray Bursts and Cosmic Rays from Accretion Induced Collapse, Dar, A., Kozlovsky, B., Nussinov, S. and Ramaty, R., 1992, ApJ, 388, 164
108. "High Energy Gamma Ray Emission from Pion Decay in Solar Flare Magnetic Loops", Mandzhavidze, N. and Ramaty, R. 1992, ApJ, 389, 739
109. "Diffuse 0.511 MeV Line Emission and the Distribution of Positrons Annihilation in the Galaxy", Skibo, J. G. Ramaty, R. and Leventhal, M., 1992, ApJ, 397, 135
110. "On the Origin of Variable 511 keV Line Emission from the Galactic Center Region", Ramaty, R., Leventhal, M., Chan, K. W., and Lingenfelter, R. E, 1992, ApJ (Letters), 392, L63
111. "Gamma Rays from Pion Decay: Evidence for Long Term Trapping of Particles in Solar Flares" Mandzhavidze, N., and Ramaty, R., 1992, ApJ (Letters), 396, L111
- 112 "Neutrinos form Optically Quiet Births of Neutron Stars?" Dar, A. & Ramaty, R., 1992, Nuclear Physics B, 28A, 401
113. "Diffuse Galactic Annihilation Radiation and the Present Rate of Galactic Nucleosynthesis" Lingenfelter, R., Chan, K. W., and R. Ramaty, R., 1993, Physics Reports, 227, 133
114. "Diffuse Galactic Annihilation Radiation" Ramaty, R., and Lingenfelter, R. E., 1993, Astron. & Astrophys. Suppl. Ser. 97, 127
115. "Galactic Low Energy Gamma Ray Continuum Emission" Skibo, J. G., and Ramaty, R., 1993, Astron. & Astrophys., Suppl. Ser. 97 145

116. "Acceleration in Solar Flares: Interacting versus Interplanetary Particles", R. Ramaty, N. Mandzhavidze, B. Kozlovsky and J. G. Skibo, 1993, *Adv. Space Res.*, 13, No. 9 (9)275
117. "The NASA High Energy Solar Physics Mission for the Next Solar Maximum", R. P. Lin, B. R. Dennis, A. G. Emslie, R. Ramaty, R. Canfield and G. Doschek, 1993, *Adv. Space Res.*, 13, No. 9 (9)401
118. "Particle Acceleration in Solar Flares" N. Mandzhavidze and R. Ramaty, 1993, *Nuclear Physics B*, 33, Nos. 1- 2, 141
119. "Galactic 0.511 MeV Line Emission", R. Ramaty, J. G. Skibo and R. E. Lingenfelter, 1994, *ApJ Suppl.*, 92, 393
120. "Compton Scattering in Jets: A Mechanism for \sim 0.4 and \lesssim 0.2 MeV Line Production", J. G. Skibo, C. D. Dermer and R. Ramaty, 1994, *ApJ*, 431, L39
121. "Gamma Ray and Millimeter Wave Emissions from the June 1991 X-Class Solar Flares", R. Ramaty, R. A. Schwartz, S. Enome and H. Nakajima, 1994, *ApJ*, 436, 941
122. "Gamma Ray Lines from the Orion Complex", R. Ramaty, B. Kozlovsky and R. E. Lingenfelter, 1995, *ApJ (Letters)*, 438, L21
123. "Thermal Comptonization in Mildly Relativistic Pair Plasmas", J. G. Skibo, C. D. Dermer, R. Ramaty and J. M. McKinley, 1995, *ApJ*, 446, 86
124. "Solar Atmospheric Abundances and Energy Content in Flare Accelerated Ions from Gamma Ray Spectroscopy", R. Ramaty, N. Mandzhavidze, B. Kozlovsky, R. J. Murphy, 1995, *ApJ*, 455, L193
125. "Status of the Transient Gamma Ray Spectrometer, H. Seifert, B. J. Teegarden, D. Palmer, N. Gehrels, T. L. Cline, R. Ramaty, A. Owens, K. Hurley, R. Pehl, and N. Madden, 1995, *Astrophys. and Space Sci.*, 231, 475
126. "Evolution of Energetic Protons in Twisted Magnetic Loops", Y.-T. Lau and R. Ramaty, 1995, *Solar Physics*, 160, 343
127. "Light Isotopes, Extinct Radioisotopes and Gamma Ray Lines from Low Energy Cosmic Ray Interactions", R. Ramaty, B. Kozlovsky and R. E. Lingenfelter, 1996, *ApJ*, 456, 525
128. "Implications of the Diffuse Galactic Continuum", J. G. Skibo, R. Ramaty, W. R. Purcell, 1996, *Astron. Astrophys. Suppl.*, 120, C403
129. "Interstellar Gamma Ray Lines from Low Energy Cosmic Ray Interactions", R. Ramaty, 1996, *Astron. Astrophys. (Suppl.)*, 120, C373
130. "TGRS Occultation Analysis of the Galactic Center Region", B. J. Teegarden and 7 co-authors including R. Ramaty, 1996, *Astron. Astrophys. (Suppl.)*, 120, C283
131. "TGRS Observations of the Galactic Center Annihilation Line", B. J. Teegarden and 11 co-authors including R. Ramaty, 1996, *ApJ*, 463, L75
132. "Limits on Nuclear Gamma Ray Emission from Orion", R. J. Murphy and 7 coauthors including R. Ramaty, 1996, *ApJ*, 473, 990
133. "LiBeB: High and Low Energy Cosmic Ray Production and Comparison with ν Induced Nucleosynthesis in SNII", R. Ramaty, H. Reeves, R. E. Lingenfelter, and B. Kozlovsky, 1997, *Nuclear Physics A621*, 47c-51c (Nuclei in the Cosmos IV, eds. Goerres, J., Mathews, G. J., Wiescher, M. and Shore, S.).

134. "The Giant 1991 June 1 Flare: Evidence for Gamma Ray Production in the Corona and Accelerated Heavy Ion Abundance Enhancements from Gamma Ray Spectroscopy", R. Ramaty, N. Mandzhavidze, C. Barat and G. Trottet, 1997, ApJ, 479, 458
135. "Light Element Production by Low Energy Nuclei from Massive Stars", E. Vangioni-Flam, M. Cassé, 1997, R. Ramaty 1997, in Proc. 2nd INTEGRAL Workshop, ed. C. Winkler et al., ESA SP-382, p. 123
136. "Issues Concerning The Orion Gamma Ray Line Observations: Line Splitting and LiBeB Origin", R. Ramaty, B. Kozlovsky, R. E. Lingenfelter, 1997, in Proc. 2nd INTEGRAL Workshop, ed. C. Winkler et al., ESA SP-382, p. 41
137. "Anisotropic Broad Nuclear Gamma Ray Lines: Application to the COMPTEL Observations of Orion", B. Kozlovsky, R. Ramaty and R. E. Lingenfelter, 1997, ApJ, 484, 286
138. "Light Elements and Cosmic Rays in the Early Galaxy", R. Ramaty, B. Kozlovsky, R. E. Lingenfelter and H. Reeves, 1997, ApJ, 488, 730
139. "Solar Atmospheric and Solar Flare Helium Abundances from Gamma Ray Spectroscopy", N. Mandzhavidze, R. Ramaty, and B. Kozlovsky, 1997, ApJ (Letters), 489, L99
140. "Cosmic Rays, Nuclear Gamma Rays, and the Origin of the Light Elements", R. Ramaty, B. Kozlovsky and R. E. Lingenfelter, 1998, Physics Today, 51, No. 4, 30
141. "Supernova Grains: The Source of Cosmic Ray Metals", R. E. Lingenfelter, R. Ramaty, and B. Kozlovsky, 1998, ApJ, 500, L153
142. "X-Rays from Accelerated Ion Interactions", V. Tatischeff, R. Ramaty and B. Kozlovsky, 1998, ApJ, 504, 874
143. "TGRS Measurements of the Positron Annihilation Spectrum from the Galactic Center", M. J. Harris, B. J. Teegarden, T. L. Cline, N. Gehrels, D. M. Palmer, R. Ramaty, H. Seifert, 1998, ApJ, 501, L55
144. "Testing the Primary Origin of Be and B in the Early Galaxy", E. Vangioni-Flam, R. Ramaty, K. Olive, & M. Cassé, 1998, Astron & Astrophys., 337, 714
145. "Cosmic Ray Acceleration from Supernova Ejecta in Superbubbles", J. C. Higdon, R. E. Lingenfelter, & R. Ramaty, 1998, ApJ (Letters), 509, L33
146. "Diffuse 0.5-1 keV X-Rays and Nuclear Gamma-Rays from Fast Particles in the Local Hot Bubble", V. Tatischeff and R. Ramaty, 1999, ApJ, 511, 204
147. "Determination of the Abundances of Subcoronal ${}^4\text{He}$ and of Solar Flare Accelerated ${}^3\text{He}$ and ${}^4\text{He}$ from Gamma-Ray Spectroscopy", N. Mandzhavidze, R. Ramaty & B. Kozlovsky, 1999, ApJ, 518, 918
148. "LiBeB, Cosmic Rays and Gamma-Ray Line Astronomy", R. Ramaty, E. Vangioni-Flam, M. Cassé, & K. Olive, 1999, Publ. Astron. Soc. Pacific, 111, 651
149. "Light Element Evolution and Cosmic Ray Energetics", R. Ramaty, S. T. Scully, R. E. Lingenfelter, & B. Kozlovsky, 2000, ApJ, 534, 747
150. "Lithium-6 from Solar Flares", Reuven Ramaty, Vincent Tatischeff, J. P. Thibaud, Benzion Kozlovsky, Natalie Mandzhavidze, 2000, ApJ (Letters), 534, L207

151. "Gamma-Ray Evidence for Time-Dependent Heavy Ion Enhancement in a Solar Flare", R. Ramaty, G. Linters, N. Mandzhavidze, & J. A. Miller, 2000, The Acceleration and Transport of Energetic Particles Observed in the Heliosphere, AIP, in press
152. "Cosmic Ray Acceleration in Superbubbles and the Composition of Cosmic Rays", R.E. Lingenfelter, J.C. Higdon, & R. Ramaty, 2000, The Acceleration and Transport of Energetic Particles Observed in the Heliosphere, AIP, in press
153. "On the Origin of the Iron K Line in the Spectrum of the Galactic X-Ray Background", A. Valinia, V. Tatischeff, K. Arnaud, K. Ebisawa & R. Ramaty, ApJ, in press
154. "Hard X-Rays from Neutralized Ion Beams in Solar Flares", J.C. Brown, M. Karlický, N. Mandzhavidze & R. Ramaty, 2000, ApJ, 541, October 1, in press
155. "High Latitude Radiation and Resonant Enhancements of the Jovian Synchrotron Emissions", I. Roth & R. Ramaty, 2000, Planetary Space Sciences, in press
156. "Spallogenic Light Elements and Cosmic Ray Origin", R. Ramaty, R. E. Lingenfelter, & B. Kozlovsky, 2001, Space Science Reviews and The Astrophysics of Galactic Cosmic Rays, Space Sciences Series of ISSI, vol. 13, R. Diehl, R. Kallenbach, E. Parizot, and R. von Steiger eds., (Dordrecht: Kluwer), in press

OTHER SIGNIFICANT PUBLICATIONS:

1. 1967 "The Influence of Geomagnetic Shielding on ^{14}C Production and Content", R. Ramaty, Magnetism and the Cosmos, ed. Hindmarsh et al., Oliver and Boyd, p. 66
2. 1967 "High Energy Nuclear Reactions in Solar Flares", R. E. Lingenfelter and R. Ramaty, High Energy Nuclear Reactions in Astrophysics, ed B. S. P. Shen, Benjamin, p. 99.
3. 1970 "Astrophysical and Geophysical Variations in ^{14}C Production", R. E. Lingenfelter and R. Ramaty, Radiocarbon Variations and Absolute Chronology, Almquist and Wiksell, Uppsala, Sweden.
4. 1971 "The Effects of Propagation and Source Distribution on Cosmic Ray Composition and Anisotropy", R. Ramaty and R. E. Lingenfelter, Isotopic Composition of the Primary Cosmic Radiation, ed. P. M. Dauber, Danish Space Research Institute, p. 203.
5. 1971 "Cosmic Ray Propagation and Source Distribution", R. E. Lingenfelter and R. Ramaty, Proc. 12th Intl. Conf. on Cosmic Rays, Hobart, Tasmania, 1, 377.
6. 1973 "Nuclear Gamma Rays from Solar Flares", R. Ramaty and R. E. Lingenfelter, High Energy Phenomena in Solar Flares, NASA SP 342, 301.
7. 1973 "Theory of Solar Microwave Bursts", R. Ramaty, High Energy Phenomena in Solar Flares, NASA SP 342, 188.
8. 1973 "On the Origin of the Electron to Proton Ratio in Cosmic Rays", J. M. Cohen and R. Ramaty, 13th Intl. Cosmic Ray Conf., Denver, Colorado 1, 634.
9. 1974 "Black Body Radiation: A Mechanisms for Cosmic Gamma Ray Bursts" R. Ramaty and J. M. Cohen, Transient Cosmic Gamma and X Ray Sources, compiled by I. B. Strong, p. 146.

10. 1974 "Cosmic Electrons", R. Ramaty, High Energy Particles and Quanta in Astrophysics, edited by F. B. McDonald and C. E. Fichtel, M.I.T. Press, p. 122.
11. 1975 "Solar ^3He : Information from Nuclear Reactions in Flares", R. Ramaty and B. Kozlovsky, 6th Leningrad Seminar on Particle Acceleration and Nuclear Reactions in Space, G. E. Kocharov and V. A. Dergacheva, Editors, p. 58.
12. 1975 "Gamma Ray Lines from Solar Flares", R. Ramaty and R. E. Lingenfelter, Solar Gamma, X, and EUV Radiation, S. Kane Editor, IAU, p. 363.
13. 1975 "Gamma Ray and Radio Evidence for the Acceleration of High Energy Particles in Solar Flares", T. Bai and R. Ramaty, 14th Intl. Cosmic Ray Conf. 5, l662.
14. 1975 "Positron Annihilation in Solar Flares", C. J. Crannell, R. Ramaty, 14th Intl. Cosmic Ray Conf. 5, l656.
15. 1975 "The Origin and Implications of Gamma Rays from Solar Flares" R. Ramaty, GSFC X-660-75-79.
16. 1975 "Time Dependent 2.2 MeV and 0.5 MeV Lines in Solar Flares", R. Ramaty and H. T. Wang 14th Intl. Cosmic Ray Conf. 5, l635.
17. 1977 "Diffuse Galactic Gamma Ray Lines", R. E. Lingenfelter and R. Ramaty, The Structure and Content of the Galaxy and Galactic Gamma Rays, NASA CP002, p. 237.
18. 1978 "Mechanisms and Sites for Astrophysical Gamma Ray Line Production", R. Ramaty, in Gamma Ray Spectroscopy in Astrophysics, ed. T. L. Cline and R. Ramaty, NASA TM 79610.
19. 1978 "Gamma Ray Emission and Solar Flares", R. P. Lin and R. Ramaty, in Gamma Ray Spectroscopy in Astrophysics, ed. T. L. Cline and R. Ramaty, NASA TM 79619, p. 76.
20. 1978 "Gamma Ray Line Astronomy: A Review", R. E. Lingenfelter and R. Ramaty in Proceedings of the 10th International Seminar on the Problem of Nuclear Space Physics, Leningrad, p. 231.
21. 1979 "Energetic Particles in Solar Flares", R. Ramaty, Particle Acceleration in Astrophysics, AIP, p. 135.
22. 1979 "Primary Cosmic Ray Positrons and Galactic Annihilation Radiation", R. E. Lingenfelter and R. Ramaty, 16th Internat. Cosmic Ray Conf. Papers, 1, 510.
23. 1980 "Cosmic Gamma Ray Lines: Theory", R. E. Lingenfelter and R. Ramaty, Non Solar Gamma Rays (Cospar), R. Cowsik and R. D. Wills, eds, Pergamon Press, p. 103.
24. 1981 "Gamma Ray Lines from the Galactic Center and Gamma Ray Transients", R. Ramaty, D. Leiter and R. E. Lingenfelter, Ann. N. Y. Acad. Sci., 375, 338.
25. 1981 "Origin of 0.511 MeV Emission from the Galactic Center", R. E. Lingenfelter, R. Ramaty and D. Leiter, Conference Papers, 17th Intl. Cosmic Ray Conf. 1, 112.
26. 1981 "Interplanetary Particle Observations Associated with Solar Flare Gamma Ray Line Emission", T. T. Von Rosenvinge, R. Ramaty and D. V. Reames, Conference Papers, 17th Intl. Cosmic Ray Conf. 3, 28.
27. 1982 "Gamma Ray Lines from Solar Flares and Cosmic Transients", R. Ramaty, R. E. Lingenfelter, B. Kozlovsky, Gamma Ray Transients and Related Astrophysics,

- Eds. R. E. Lingenfelter, H. S. Hudson and D. M. Worrall (New York: AIP), 211.
28. 1982 "On the Origin of Positron Annihilation Radiation from the Galactic Center" R. E. Lingenfelter and R. Ramaty, *The Galactic Center* (G. R. Riegler and R. D. Blandford eds.) (New York: AIP), p. 148.
29. 1983 "Positron-Electron Annihilation from the Galactic Center", R. Ramaty and R. E. Lingenfelter, *Highlights of Astronomy* (ed: R. M. West) Reidel, 6, 525.
30. 1983 "Solar Flare Neutrons and Gamma Ray Lines", R. E. Lingenfelter, R. Ramaty, R. J. Murphy, and B. Kozlovsky, 18th Intern. Cosmic Ray Conf. Papers, 4, 101.
31. 1984 "Neutrons and Gamma Rays from Solar Flares", R. Ramaty and R. J. Murphy, *High Energy Transients in Astrophysics*, (S. E. Woosley, ed.) (New York: AIP), p. 628.
32. 1984 "Particle Acceleration", R. Rosner, E. L. Chupp, G. Gloeckler, D. J. Gorney, S. M. Krimigis, Y. Mok, R. Ramaty, D. W. Swift, L. Vlahos, E. G. Zweibel, Chapter 2 in *Solar Terrestrial Physics*, eds. D. M. Butler and K. Papadopoulos, NASA Reference Publication 1120.
33. 1984 "Neutron and Gamma-Ray Signatures for Particle Acceleration in Solar Flares", R. Ramaty and R. J. Murphy, *Plasma Astrophysics*, (ESA:Paris), p. 83.
34. 1985 "Gamma-Ray Line Astronomy", R. Ramaty, in *High Energy Astrophysics*, ed. J. Tran Thanh Van (Frontier:Gif Sur Yvette, France) p. 243.
35. 1985 "Abundances from Solar Flare Gamma-Ray Line Spectroscopy", R. J. Murphy, R. Ramaty, D. J. Forrest and B. Kozlovsky, 19th Internat. Cosmic Ray Conf. Papers, 4, 249.
36. 1985 "Solar Flare Gamma Ray Line Spectroscopy", R. J. Murphy, D. J. Forrest, R. Ramaty and B. Kozlovsky, 19th Internat. Cosmic Ray Conf. Papers, 4, 253.
37. 1986 "Topics in Gamma-Ray Astronomy", R. Ramaty and R. E. Lingenfelter, *Ann. N.Y. Acad. Sci.*, 470, 215.
38. 1986 "Gamma-Ray Line Astrophysics", R. E. Lingenfelter and R. Ramaty, 19th Intl. Cosmic Ray Conference Papers, 9, 19.
39. 1986 "Neutron and Antineutron Production in Accretion onto Compact Objects", C. D. Dermer and R. Ramaty, *Accretion Processes in Astrophysics*, eds. J. Audouze and J. Tran Than Van, Frontiers, Gif sur Yvette, p. 85.
40. 1987 "Galactic Positron Annihilation Radiation", R. Ramaty, R. E. Lingenfelter, *The Galactic Center*, D. C. Backer ed. (AIP: New York), p. 155.
41. 1987 "Stochastic Acceleration in the Transrelativistic Region and Pion Production in Solar Flares", J. A. Miller, R. Ramaty, R. J. Murphy, 20th Internat. Cosmic Ray Conf. Papers, 3, 33.
42. 1987 "Particle Acceleration in Solar Flares", R. Ramaty and M. A. Forman, in *Essays in Space Science*, R. Ramaty, T. L. Cline and J. F. Ormes eds., NASA CP-2642, p. 47.
43. 1987 "The Pulsar Contribution to Galactic Cosmic Ray Positrons", A. K. Harding and R. Ramaty, 20th Internat. Cosmic Ray Papers, 2, 92.

44. 1987 "Neutral Radiations and Particle Acceleration at the Sun", Rapporteur Paper, 20th International Cosmic Ray Conference Papers, 8, 127
45. 1988 "Models of Gamma Ray Production in Solar Flares", R. Ramaty, J. A. Miller, X. M. Hua, and R. E. Lingenfelter, in Nuclear Spectroscopy of Astrophysical Sources, eds. Gehrels and G. Share (New York: AIP), p. 217.
46. 1989 "Solar Abundances from Gamma Ray Spectroscopy", R. Ramaty, (New York: AIP), p. 91.
47. 1989 "Annihilation Radiation and Gamma Ray Continuum from the Galactic Center Region" R. E. Lingenfelter and R. Ramaty, The Center of the Galaxy, ed. M. Morris, Dordrecht:Reidel, p. 587.
48. 1989 "The Galactic Positron Annihilation Radiation and its Sources" R. E. Lingenfelter and R. Ramaty, in Gamma Ray Observatory Science Workshop, ed. W. N. Johnson, NRL, Washington, DC, p. 4-245.
49. 1990 "Gamma-Ray Evidence for a Stellar Mass Black Hole near the Galactic Center" R. Ramaty and R. E. Lingenfelter, Annals of the New York Academy of Sciences, vol. 571, 433.
50. 1990 "Ion Acceleration by Alfvén Turbulence in Solar Flares" J. A. Miller and R. Ramaty, 21st Internat. Cosmic Ray Conf. Papers, vol 5, 36.
51. 1990 "Positronium and Positron Annihilation in the Galaxy" R. Ramaty and R. E. Lingenfelter, 21st Internat. Cosmic Ray Conf. Papers, vol. 3, 261.
52. 1990 "Diffusive Shock Acceleration of Decay Positrons in Supernovae", D. C. Ellison, F. C. Jones and R. Ramaty, 21st Internat. Cosmic Ray Conf. Papers, vol 4, 68.
53. 1990 "Nuclear Processes and Particle Acceleration in Solar Flares", R. Ramaty, Proc. of the 1989 International Nuclear Physics Conference Sao Paulo, vol 2, 763.
54. 1990 "Solar Accelerated Particles: Comparisons of Abundances and Energy Spectra from Particle and Gamma-Ray Observations", R. Ramaty, R. J. Murphy, J. A. Miller, in Particle Astrophysics, eds. W. V. Jones, F. J. Kerr and J. F. Ormes, (AIP: New York), 143.
55. 1990 "Flare Physics at High Energies" R. Ramaty, Astrophysics from the Moon, eds. M. J. Mumma and H. J. Smith, (AIP: New York), 122.
56. 1990 "Positron Diagnostics of the Galaxy" R. Ramaty and R. E. Lingenfelter, Physics World, 3, No. 11, 25.
57. 1990 "Sun, High Energy Particle Emissions", R. Ramaty, The Astronomy and Astrophysics Encyclopedia, ed. S. P. Maran, Van Nostrand Reinhold, New York, 862.
58. 1990 "Gamma Ray Bursts and the Birthrate of Bare Neutron Stars" R. Ramaty, A. Dar, S. Nussinov and B. Kozlovsky, in Gamma Ray Bursts: Observations, Analyses and Theories, eds. Cheng Ho, R. I. Epstein and E. E. Fenimore, Cambridge University Press, p. 62.
59. "High Energy Astrophysics in Solar Flares" Ramaty, R. and Chupp, E. L., in Currents in Astrophysics and Cosmology, ed. Fazio,G., Cambridge University Press, 1992, in press

60. "Positron Annihilation Radiation from the Galactic Center Region" Ramaty, R. and Lingenfelter, R. E., in Gamma Ray Line Astrophysics, eds. Durouchoux, P., and Prantzos, N., 1991, (AIP: New York), p. 67
61. "Shifts of the ^{26}Al Line due to Galactic Rotation" Skibo, J. G. and Ramaty, R., Gamma Ray Line Astrophysics, eds. Durouchoux, P. and Prantzos, N., 1991, (AIP: New York), p. 168
62. "Neutron and Gamma Ray Production in the 1991 June X-Class Flares", Ramaty, R., Hua, X. M., Kozlovsky, B., Lingenfelter, R. E., and Mandzhavidze, N., The Compton Observatory Science Workshop, Shrader, C., Gehrels N., and Dennis, B., 1992, Eds, NASA, 480
63. "Galactic Positron Annihilation Radiation" Ramaty, R. and Lingenfelter, R. E., 1992, Ann. N. Y. Acad. Sci., 655, 319
64. "Stochastic Acceleration in Impulsive Flares" Miller, J. A., & Ramaty, R., 1992, in Particle Acceleration in Cosmic Plasmas, eds. G. Zank & T. Gaisser (New York: AIP), 223
65. "Diffuse Galactic Low Energy Gamma Ray Continuum Emission" Skibo, J. and Ramaty, R. 1993, in Compton Gamma Ray Observatory, eds. M. Friedlander, N. Gehrels and D. J. Macomb, 70
66. "Galactic Annihilation Radiation and the Galactic Nucleosynthesis Rate", Chan, K. W., Lingenfelter, R. E. and Ramaty, R., 1993, in Compton Gamma Ray Observatory, eds. M. Friedlander, N. Gehrels and D. J. Macomb, 75
67. "High Energy Processes in Solar Flares", Ramaty, R. and Mandzhavidze, N. 1993, in Compton Gamma Ray Observatory, eds. M. Friedlander, N. Gehrels and D. J. Macomb, 643
68. "Solar Flare Neutron Spectra and Accelerated Ion Pitch Angle Scattering", Lingenfelter, R. E., Hua, X. M. and Ramaty, R., 1993, in Compton Gamma Ray Observatory, eds. M. Friedlander, N. Gehrels and D. J. Macomb, 656
69. "The Transient Gamma Ray Spectrometer: A New High Resolution Detector for Gamma Ray Burst Spectroscopy" Seifert, H. with 11 co-authors including Ramaty, R., 1993, in Compton Gamma Ray Observatory, eds. M. Friedlander, N. Gehrels and D. J. Macomb, 1156
70. "Diffuse <1MeV Galactic Gamma Rays", Ramaty, R. and Skibo, J. 1993, Back to the Galaxy, Eds. S. S. Holt and F. Verter, (AIP: New York), 399
71. "Ultra Hot Gas in the Galaxy: Possible Origins and Implications", Ozernoy, L., Titarchuk, L., and Ramaty, R. 1993, Back to the Galaxy, Eds. S. S. Holt and F. Verter, (AIP: New York), 399
72. "Pion Decay and Nuclear Line Emission from the 1991 June 15 Flare", N. Mandzhavidze, R. Ramaty, V. V. Akimov and N. G. Leikov, 23rd Internat. Cosmic Ray Conf. Papers, 3, 119, 1993
73. "Primary and Secondary Cosmic Ray Positrons and Electrons", J. G. Skibo and R. Ramaty, 23rd Internat. Cosmic Ray Conf. Papers, 2, 132, 1993
74. "The NASA High Energy Solar Physics Mission (HESP)", B. R. Dennis, A. G. Emslie, R. Canfield, G. Doschek, R. P. Lin, and R. Ramaty, 1993, in High Energy Solar Phenomena, eds. J. M. Ryan and W. T. Vestrand (AIP: New York), p. 230

75. "Theoretical Models for High Energy Solar Flare Emissions", R. Ramaty and N. Mandzhavidze, 1993, in High Energy Solar Phenomena, eds. J. M. Ryan and W. T. Vestrand (AIP: New York), p. 26
76. "Trapping of Protons in Twisted Magnetic Loops, Y. T. Lau and R. Ramaty, 1993, in High Energy Solar Phenomena, eds. J. M. Ryan and W. T. Vestrand (AIP: New York), p. 71
77. "Gamma Ray Line Radiation, Ramaty, R. and Lingenfelter, R. E., 1994, in High Energy Astrophysics, ed. J. Matthews, (Singapore: World Scientific), p. 32
78. "On the Origin of Long Lasting Gamma Ray Emission from Solar Flares", R. Ramaty and N. Mandzhavidze, 1994, Proceedings of the Kofu Symposium, New Look at the Sun with Emphasis on Advanced Observations of Coronal Dynamics and Flares, eds. S. Enome and T. Hirayama, NRO Report No. 360, p. 275
79. "Astrophysical Gamma Ray Lines from Accelerated Particle Interactions", R. Ramaty, 1995, in The Gamma Ray Sky with COMPTON GRO and SIGMA, M. Signore, P. Salati and G. Vedrenne, eds. (Dordrecht: Kluwer), 279
80. "Analysis and Implications of the Nuclear Line Emission from the Orion Complex", R. Ramaty, B. Kozlovsky and R. E. Lingenfelter, 1995, Ann. New York Academy of Sciences, (17th Texas Symposium on Relativistic Astrophysics and Cosmology, eds. H. Bohringer, G. E. Morfill and J. Trumper), 759, 392
81. "Astrophysical Gamma Ray Emission Lines", R. Ramaty and R. E. Lingenfelter, 1995, in The Analysis of Emission Lines, eds. R. E. Williams and M. Livio, (Cambridge: Cambridge Univ. Press), 180
81. "Gamma Ray Continuum and Millimeter Wave Emissions from Solar Flares", 1996, in Current Perspectives in High Energy Astrophysics, ed. J. F. Ormes, (NASA Ref. Publ. 1391), 13
83. "Solar Atmospheric Abundances from Gamma Ray Spectroscopy", R. Ramaty, N. Mandzhavidze, and B. Kozlovsky, 1996, in High Energy Solar Physics, eds. R. Ramaty, N. Mandzhavidze and X.-M. Hua, (AIP: New York), p. 172
84. "Thin Target Gamma Ray Line Production During the 1991 June 1 Flare", G. Trottet, C. Barat, R. Ramaty et al., 1996, in High Energy Solar Physics, eds. R. Ramaty, N. Mandzhavidze and X.-M. Hua, (AIP: New York), p. 153
85. "Abundance Determinations from Gamma Ray Spectroscopy", R. Ramaty, 1996, Cosmic Abundances, eds. S. S. Holt and G. Sonneborn, Astronomical Society of the Pacific, Conference Proceedings, 99, 377
86. "From Solar Flares to the Big Bang", R. Ramaty, 1996, Cosmic Abundances, eds. S. S. Holt and G. Sonneborn, Astronomical Society of the Pacific, Conference Proceedings, 99, 419
87. "Low Energy Cosmic Ray Interactions in Astrophysics", R. Ramaty, 1996, in The Sun and Beyond, ed. Jean Tran Thanh Van et al., Proc. of the Second Rencontres du Vietnam, Ho Chi Minh City, October 1995, p. 275
88. "Pion Decay and Nuclear Line Emissions from the 1991 June 11 Flare" N. Mandzhavidze, R. Ramaty, D. Bertsch, and E. J. Schneid, 1996, in High Energy Solar Physics, eds. R. Ramaty, N. Mandzhavidze and X.-M. Hua, (AIP: New York), p. 225

89. "Implications of Solar Flare Charged Particle, Gamma Ray and Neutron Observations: Rapporteur Paper II for the High Energy Solar Physics Workshop", R. Ramaty and N. Mandzhavidze, 1996, in High Energy Solar Physics, eds. R. Ramaty, N. Mandzhavidze and X.-M. Hua, (AIP: New York), p. 533
90. " α - α Fusion Reactions in Solar Flares: Accelerated and Ambient He Abundances and Li Production", N. Mandzhavidze, R. Ramaty and B. Kozlovsky, 1997, 25th Internat. Cosmic Ray Conference, 1, 9
91. "Nuclear Gamma Ray Lines and Lithium Production in Pure He Accretion Disks", N. Guessoum, R. Ramaty and B. Kozlovsky, 1997, 25th Internat. Cosmic Ray Conference, 3, 145
92. "Positron Annihilation in the Orion Cloud", N. Guessoum, J. G. Skibo and R. Ramaty, 1997, 25th Internat. Cosmic Ray Conference, 3, 149
93. "Issues Concerning the Orion Gamma Ray Line Observations: Overview and X-Ray Emission", R. Ramaty, B. Kozlovsky and V. Tatischeff, 1997, Proc. 4th COMPTON Symposium, eds. C.D. Dermer, M.S. Strickman and J.D. Kurfess, (AIP:New York), 1049
94. "Constraints from Pion Production on the Spectral Hardness of the Low Energy Cosmic Rays in Orion", V. Tatischeff, R. Ramaty, and N. Mandzhavidze, 1997, Proc. 4th COMPTON Symposium, eds. C.D. Dermer, M.S. Strickman and J.D. Kurfess, (AIP:New York), 1054
95. "Gamma Ray Implications for the Origin and the Acceleration of Cosmic Rays", R. Schlickeiser, M. Pohl, R. Ramaty, and J. G. Skibo, 1997, Proc. 4th COMPTON Symposium, eds. C.D. Dermer, M.S. Strickman and J.D. Kurfess, (AIP:New York), 449
96. "Gamma Rays from Solar Flares", N. Mandzhavidze and R. Ramaty, 1997, Highlights of Astronomy Vol. 11B, as presented at the XXIIIrd General Assembly of the IAU, 1997. Edited by Johannes Andersen. Kluwer Academic Publishers, 1998., pp.759-762
97. "Light Elements and Cosmic Rays in the Early Galaxy", R. Ramaty, B. Kozlovsky, R. E. Lingenfelter and H. Reeves, 1998, The Scientific Impact of the Goddard High Resolution Spectrograph, ASP Conference Series, 143, 303
98. "Solar Flares: Gamma Rays", R. Ramaty & N. Mandzhavidze, 2000, Encyclopedia for Astronomy (Macmillan), in press
99. "LiBeB and the Origin of Cosmic Rays", R. Ramaty, R. E. Lingenfelter, & B. Kozlovsky 1999, Proc. Nuclei in the Cosmos V, ed. N. Prantzos and S. Harissopoulos (Paris: Editions Frontieres), 52
100. "Early Galactic Li, Be and B: Implications on Cosmic Ray Origin", R. Ramaty & R. E. Lingenfelter, 1999, "Topics in cosmic-ray astrophysics", Horizons in World Physics, vol. 230, ed. M. A. DuVernois, (New York: Nova Science Publishers), 213
101. "Li Be B Energetics and Cosmic Ray Origin", R. Ramaty & R. E. Lingenfelter, 1999, in Galaxy evolution: Connecting the distant Universe with the local fossil record, (Kluwer: Dordrecht), Astrophysics and Space Science, 265, 71

102. "Nucleosynthesis and Gamma Ray-Line Astronomy", E. Vangioni-Flam, R. Ramaty & M. Cassé, 2000, Texas Symposium on Relativistic Astrophysics and Cosmology, E. Augburg, T. Montmerle and J. Paul, eds., Nuclear Physics B (Proc. Suppl.), 80, 215
103. "Spallogenic Light Elements and Cosmic-Ray Origin", R. Ramaty & R. E. Lingenfelter, 1999, in LiBeB, Cosmic Rays and Related X- and Gamma-Rays, Proc. Astron. Soc. Pacific, 171, 104
104. "Nonthermal X-Rays from the Galactic Ridge: a Tracer of Low Energy Cosmic Rays", V. Tatischeff, R. Ramaty, & A. Valinia, 1999, in LiBeB, Cosmic Rays and Related X- and Gamma-Rays, Proc. Astron. Soc. Pacific, 171, 226
105. "Concluding Remarks: Theoretical Aspects", E. Vangioni-Flam, R. Ramaty, M. Cassé & K. Olive, 1999, in LiBeB, Cosmic Rays and Related X- and Gamma-Rays, Proc. Astron. Soc. Pacific, 171, 268
106. "The Source of Cosmic Rays: 1. Be/Fe Evolution & Cosmic Ray Composition", 1999, R. Ramaty, R. E. Lingenfelter & B. Kozlovsky, 26th Internat. Cosmic Ray Conference, eds. D. Kieda et al. (Salt Lake City: ICRC), 4, 140
107. "The Source of Cosmic Rays: 2. Superbubble Composition", 1999, J. C. Higdon, R. E. Lingenfelter & R. Ramaty, 26th Internat. Cosmic Ray Conference, eds. D. Kieda et al. (Salt Lake City: ICRC), 4, 144
108. "The Source of Cosmic Rays: 3. Supernova Grain Composition", R. E. Lingenfelter & R. Ramaty, 1999, 26th Internat. Cosmic Ray Conference, eds. D. Kieda et al. (Salt Lake City: ICRC), 4, 148
109. "Rain of Fire", R. Ramaty, J. C. Higdon, R. E. Lingenfelter, & B. Kozlovsky, in The Sciences, published by the New York Academy of Sciences, November-December 1999 issue, p. 24
110. "Gamma Rays from Solar Flares", R. Ramaty & N. Mandzhavidze, 2000, in Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas, eds. P. C. H. Martens, S. Tsuruta and M. A. Weber, IAU Symp. 195, ASP, 123
111. "Nucleosynthesis by Accelerated Particles", R. Ramaty & B. Kozlovsky, 1999, in Astronomy with Radioactivities, ed. R. Diehl & D. Hartmann, MPE Report 274, 149
112. "High Energy Processes in Solar Flares", R. Ramaty & N. Mandzhavidze, 2000, in Cosmic Explosions, eds. S. Holt & W. Zhang, (AIP Conf. Proc. 522), 401
113. "LiBeB Evolution: Three Models", R. Ramaty, R. E. Lingenfelter, & B. Kozlovsky, 2000, Light Elements and Their Evolution, IAU, L. da Silva, M. Spite and J. R. de Medeiros, eds., in press
114. "Particle Acceleration and Abundances from Gamma-Ray Line Spectroscopy", N. Mandzhavidze & R. Ramaty, 2000, High Energy Solar Physics – Anticipating HESSI, R. Ramaty & N. Mandzhavidze, eds., ASP Conference Series, vol. 206, 64
115. "Hard X-Rays from MeV Neutral Beams", J. C. Brown, M. Karlický, N. Mandzhavidze & R. Ramaty, 2000, High Energy Solar Physics – Anticipating HESSI, R. Ramaty & N. Mandzhavidze, eds., ASP Conference Series, vol. 206, 210